Package: blueant (via r-universe)

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Type Package

Title Antarctic and Southern Ocean Environmental Data Sources

Version 0.13.5

Description A collection of data source definitions that can be used with the bowerbird package. These sources define a range of environmental and other data sources useful to Antarctic and Southern Ocean studies.

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BugReports https://github.com/AustralianAntarcticDivision/blueant/issues

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`bb_handler_amps` *Handler for AMPS data (Antarctic mesoscale prediction system)*

Description

This is a handler function to be used with AMPS data from http://www2.mmm.ucar.edu/rt/amps/. This function is not intended to be called directly, but rather is specified as a `method` option in `bowerbird::bb_source()`.

Usage

```
bb_handler_amps(...)
```

Arguments

`...`	: parameters passed to `bowerbird::bb_rget()`

Value

`TRUE` on success

References

http://www2.mmm.ucar.edu/rt/amps/

bb_handler_argo *Handler for Argo profile data sources*

Description

This is a handler function to be used with Argo data. Tested with the Global Data Access Centre in Monterey, USA (US Global Ocean Data Assimilation Experiment) and Ifremer data centre, not yet tested with others. This function is not intended to be called directly, but rather is specified as a `method` option in `bowerbird::bb_source()`.

Usage

```
bb_handler_argo(...)
```

Arguments

...	: parameters passed to `bowerbird::bb_rget()`

Details

This handler can take several `method` arguments as specified in the `bowerbird::bb_source()` constructor:

- profile_type string: either "merge" (default) or "synthetic" (currently only available from certain DACs)
- institutions character: vector of institution codes. Only profiles from these institutions will be downloaded (current institution codes are "AO", "BO", "IF", "HZ", "CS", "IN")
- parameters character: vector of parameter codes. Only profiles with one or more of these parameters will be downloaded (current parameter set is "BBP470", "BBP532", "BBP700", "BISULFIDE", "CDOM", "CHLA", "CNDC", "CP660", "DOWN_IRRADIANCE380", "DOWN_IRRADIANCE412", "DOWN_IRRADIANCE443", "DOWN_IRRADIANCE490", "DOWN_IRRADIANCE555", "DOWNWELLING_PAR", "DOXY", "NITRATE", "PH_IN_SITU_TOTAL", "PRES", "PSAL", "TEMP", "TURBIDITY", "UP_RADIANCE412", "UP_RADIANCE443", "UP_RADIANCE490", "UP_RADIANCE555")
- latitude_filter function: this function is applied to each profile's `latitude` value; only profiles for which this function returns `TRUE` will be downloaded
- longitude_filter function: as for `latitude_filter`, but applied to longitude

See `sources_oceanographic()` for more details and examples.

Value

`TRUE` on success

References

https://wwz.ifremer.fr/en/Research-Technology/Scientific-departments/Department-of-Marine-and-Digit
The-French-ARGO-Data-Centre, http://www.argodatamgt.org/Documentation

bb_handler_polarview *Handler for Polarview Sentinel-1 data*

Description

This is a handler function to be used with Sentinel-1 data from https://polarview.aq. This function is not intended to be called directly, but rather is specified as a method option in bowerbird::bb_source().

Usage

```
bb_handler_polarview(...)
```

Arguments

...	: parameters passed to bowerbird::bb_rget()

Value

TRUE on success

References

https://polarview.aq

bb_handler_usnic *Handler for US National Ice Center charts*

Description

This is a handler function to be used with US National Ice Center charts from https://usicecenter.gov/Products/AntarcHome. This function is not intended to be called directly, but rather is specified as a method option in bowerbird::bb_source().

Usage

```
bb_handler_usnic(...)
```

Arguments

...	: parameters passed to bowerbird::bb_rget()

Details

Note that the USNIC server does not support timestamp operations on requests, so it is not possible to download only files that have changed since last downloaded. Bowerbird configurations with `clobber = 1` (download if modified) are likely to download all files, even if those files exist locally and have not changed since last download. Consider using `clobber = 0` (don't download if file already exists).

This handler can take a `method` argument as specified in the `bowerbird::bb_source()` constructor:

- chart_type string: either "filled" (default) or "vector"

Value

`TRUE` on success

References

https://usicecenter.gov/Products/AntarcHome

---

bb_oisst_cleanup *Postprocessing: remove redundant near-real-time OISST files*

Description

This function is not intended to be called directly, but rather is specified as a `postprocess` option in `bb_source`.

Usage

```
bb_oisst_cleanup(...)
```

Arguments

`...`	: extra parameters passed automatically by `bowerbird::bb_sync`

Details

This function will remove near-real-time (NRT) files that have been superseded by their non-NRT versions.

Value

a list, with components `status` (TRUE on success) and `deleted_files` (character vector of paths of files that were deleted)

`bb_polarview_search` *Search the PolarView catalogue*

Description

This function is used by `bb_handler_polarview()`. Users probably won't need to use it directly.

Usage

```
bb_polarview_search(
  acquisition_date = Sys.Date() + -14:0,
  formats = c("jpg", "geotiff"),
  polygon = NULL,
  max_results = 200L,
  verbose = FALSE
)
```

Arguments

`acquisition_date`	Date: the allowable image acquisition dates
`formats`	character: one or more of "jpg" (jpg preview images) "jp2" or "geotiff". Note that the geotiffs are much larger than the jpg previews
`polygon`	string or sfc_POLYGON: either an `sfc_POLYGON` or a string giving a polygon in WKT format and EPSG:3031 projection. Only images intersecting this polygon will be returned
`max_results`	integer: maximum number of results to return
`verbose`	logical: if `TRUE`, show additional progress output

Value

A character vector of image URLs

References

https://www.polarview.aq

`blueant` **blueant**

Description

A collection of data source definitions that can be used with the bowerbird package. These sources define a range of environmental and other data sources useful to Antarctic and Southern Ocean studies.

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See Also

Useful links:

- https://github.com/AustralianAntarcticDivision/blueant
- Report bugs at https://github.com/AustralianAntarcticDivision/blueant/issues

---

`sources` *Bowerbird configurations for various Antarctic and Southern Ocean data sources*

Description

The `sources` function is a convenience wrapper around the thematic functions: `sources_seaice()`, `sources_altimetry()`, etc.

Usage

```
sources(name, formats, time_resolutions, ...)
```

Arguments

`name`	character vector: only return data sources with name or id matching these values
`formats`	character: for some sources, the format can be specified. See thematic source functions for details
`time_resolutions`	character: for some sources, the time resolution can be specified. See thematic source functions for details
`...`	: other parameters passed to thematic source functions

Value

A tibble

References

See `reference` and `citation` field in each row of the returned tibble

`sources_altimetry` *Altimetry data sources*

Description

Data sources providing (typically satellite-derived) altimetry data.

Usage

```
sources_altimetry(name, formats, time_resolutions, ...)
```

Arguments

`name`	character vector: only return data sources with name or id matching these values
`formats`	character: for some sources, the format can be specified. See the list of sources above for details
`time_resolutions`	character: for some sources, the time resolution can be specified. See the list of sources above for details
`...`	: additional source-specific parameters. See the list of sources above for details

Details

- "CMEMS global gridded SSH reprocessed (1993-ongoing)": Global Ocean - Multimission altimeter satellite gridded sea surface heights and derived variables computed with respect to a twenty-year mean. All the missions are homogenized with respect to a reference mission which is currently OSTM/Jason-2
- "CMEMS global gridded SSH near-real-time": near-real-time version of 'CMEMS global gridded SSH reprocessed (1993-ongoing)'
- "CNES-CLS2013 Mean Dynamic Topography": CNES-CLS2013 Mean dynamic topography over the 1993-2012 period of the sea surface height above geoid. The MDT_CNES-CLS13 is an estimate of the ocean MDT for the 1993-2012 period. Since April 2014 (Duacs 2014, v15.0 version), the Ssalto/Duacs (M)SLA products are computed relative to 1993-2012 period that is consistent with this new MDT CNES-CLS13. Based on 2 years of GOCE data, 7 years of GRACE data, and 20 years of altimetry and in-situ data (hydrologic and drifters data)
- "Gridded Sea Level Heights and geostrophic currents - Antarctic Ocean": Experimental Ssalto/Duacs gridded multimission altimeter products dedicated to Antarctic Ocean

- "Near-real-time finite size Lyapunov exponents": These products provide the exponential rate of separation of particle trajectories initialized nearby and advected by altimetry velocities. FSLEs highlight the transport barriers that control the horizontal exchange of water in and out of eddy cores.
- "Delayed-time finite size Lyapunov exponents": These products provide the exponential rate of separation of particle trajectories initialized nearby and advected by altimetry velocities. FSLEs highlight the transport barriers that control the horizontal exchange of water in and out of eddy cores.
- "WAVERYS Global Ocean Waves Reanalysis": global wave reanalysis describing past sea states since years 1993.

The returned tibble contains more information about each source.

Value

a tibble with columns as specified by `bowerbird::bb_source()`

References

See the `doc_url` and `citation` field in each row of the returned tibble for references associated with these particular data sources

Examples

```
## Not run:
## define a configuration and add the CMEMS near-real-time data to it
cf <- bb_config("/my/file/root")
src <- sources_altimetry("CMEMS global gridded SSH near-real-time")
## this source requires a username and login to the CMEMS system
src$user <- "your user name"
src$password <- "your password"
cf <- bb_add(cf,src)

## End(Not run)
```

---

sources_biological *Biological data sources*

Description

Data sources providing selected Southern Ocean biological data sets. Please note that this is not intended to be a comprehensive collection of such data. Users are referred to the SCAR Standing Committee on Antarctic Data Management (https://www.scar.org/data-products/scadm/) and in particular the Antarctic Master Directory metadata catalogue (http://gcmd.nasa.gov/portals/amd/).

Usage

```
sources_biological(name, formats, time_resolutions, ...)
```

Arguments

`name`	character vector: only return data sources with name or id matching these values
`formats`	character: for some sources, the format can be specified. See the list of sources above for details
`time_resolutions`	character: for some sources, the time resolution can be specified. See the list of sources above for details
`...`	: additional source-specific parameters. See the list of sources above for details

Details

- "Southern Ocean Continuous Plankton Recorder": zooplankton species, numbers and abundance data are recorded on a continuous basis while vessels are in transit
- "SEAPODYM Zooplankton & Micronekton weekly potential and biomass distribution": outputs of the SEAPODYM Low and Mid-Trophic Levels (LMTL) model, which simulates the spatial and temporal dynamics of six micronekton and one zooplankton functional groups between the sea surface and ~1000m depth
- "SCAR RAATD model outputs": Single-species habitat importance maps for 17 species of Antarctic and subantarctic seabirds, marine mammals, and penguins
- "SCAR RAATD data filtered": Tracking data from 17 species of Antarctic and subantarctic seabirds, marine mammals, and penguins. This data set is the 'filtered' version of the data files
- "SCAR RAATD data standardised": Tracking data from 17 species of Antarctic and subantarctic seabirds, marine mammals, and penguins. This data set is the 'standardized' version of the data files
- "Myctobase": A circumpolar database of Southern Ocean mesopelagic fish surveys, including occurrence and abundance information, as well as trait-based information of individuals including standard length, weight and life stage

The returned tibble contains more information about each source.

Value

a tibble with columns as specified by `bowerbird::bb_source()`

References

See the `doc_url` and `citation` field in each row of the returned tibble for references associated with these particular data sources

Examples

```
## our local directory to store the data
my_data_dir <- tempdir()
cf <- bb_config(my_data_dir)

## our data source to download
src <- sources("Myctobase")

## add to our config
cf <- bb_add(cf, src)

## and sync it
if (interactive()) {
  status <- bb_sync(cf)
}

## or equivalently
if (interactive()) {
  status <- bb_get(sources("Myctobase"), local_file_root = my_data_dir)
}
```

`sources_meteorological` *Meteorological data sources*

Description

Data sources providing meteorological data.

Usage

```
sources_meteorological(name, formats, time_resolutions, ...)
```

Arguments

`name`	character vector: only return data sources with name or id matching these values
`formats`	character: for some sources, the format can be specified. See the list of sources above for details
`time_resolutions`	character: for some sources, the time resolution can be specified. See the list of sources above for details
`...`	: additional source-specific parameters. See the list of sources above for details

Details

- "Antarctic Mesoscale Prediction System grib files": The Antarctic Mesoscale Prediction System - AMPS - is an experimental, real-time numerical weather prediction capability that provides support for the United States Antarctic Program, Antarctic science, and international Antarctic efforts

The returned tibble contains more information about each source.

Value

a tibble with columns as specified by `bowerbird::bb_source()`

References

See the `doc_url` and `citation` field in each row of the returned tibble for references associated with these particular data sources

Examples

```
## Not run:
## define a configuration and add the AMPS data to it
cf <- bb_config("/my/file/root") %>%
  bb_add(sources_meteorological("Antarctic Mesoscale Prediction System grib files"))

## End(Not run)
```

---

sources_ocean_colour *Ocean colour data sources*

Description

Data sources providing ocean colour data.

Usage

```
sources_ocean_colour(name, formats, time_resolutions, ...)

sources_ocean_color(name, formats, time_resolutions, ...)
```

Arguments

`name`	character vector: only return data sources with name or id matching these values
`formats`	character: for some sources, the format can be specified. See the list of sources above for details
`time_resolutions`	character: for some sources, the time resolution can be specified. See the list of sources above for details
`...`	: additional source-specific parameters. See the list of sources above for details

Details

- "Oceandata SeaWiFS Level-3 mapped monthly 9km chl-a": Monthly remote-sensing chlorophyll-a from the SeaWiFS satellite at 9km spatial resolution
- "Oceandata MODIS Aqua Level-3 mapped daily 4km chl-a": Daily remote-sensing chlorophyll-a from the MODIS Aqua satellite at 4km spatial resolution
- "Oceandata MODIS Aqua Level-3 mapped monthly 9km chl-a": Monthly remote-sensing chlorophyll-a from the MODIS Aqua satellite at 9km spatial resolution
- "Oceandata VIIRS Level-3 mapped daily 4km chl-a": Daily remote-sensing chlorophyll-a from the VIIRS satellite at 4km spatial resolution
- "Oceandata VIIRS Level-3 mapped monthly 9km chl-a": Monthly remote-sensing chlorophyll-a from the VIIRS satellite at 9km spatial resolution
- "Oceandata VIIRS Level-3 mapped seasonal 9km chl-a": Seasonal remote-sensing chlorophyll-a from the VIIRS satellite at 9km spatial resolution
- "Oceandata VIIRS Level-3 binned daily RRS": Daily remote-sensing reflectance from VIIRS. RRS is used to produce standard ocean colour products such as chlorophyll concentration
- "Oceandata MODIS Aqua Level-3 binned daily RRS": Daily remote-sensing reflectance from MODIS Aqua. RRS is used to produce standard ocean colour products such as chlorophyll concentration
- "Oceandata SeaWiFS Level-3 binned daily RRS": Daily remote-sensing reflectance from SeaWiFS. RRS is used to produce standard ocean colour products such as chlorophyll concentration
- "Oceandata VIIRS Level-3 mapped 32-day 9km chl-a": Rolling 32-day composite remote-sensing chlorophyll-a from the VIIRS satellite at 9km spatial resolution
- "Southern Ocean summer chlorophyll-a climatology (Johnson)": Climatological summer chlorophyll-a layer for the Southern Ocean south of 40S, following the OC3M algorithm of Johnson et al. (2013)

The returned tibble contains more information about each source.

Value

a tibble with columns as specified by `bowerbird::bb_source()`

References

See the `doc_url` and `citation` field in each row of the returned tibble for references associated with these particular data sources

Examples

```
## Not run:
## define a configuration and add the monthly SeaWiFS data to it
cf <- bb_config("/my/file/root")
src <- sources_ocean_colour("Oceandata SeaWiFS Level-3 mapped monthly 9km chl-a")
cf <- bb_add(cf,src)

## End(Not run)
```

`sources_oceanographic` *Oceanographic data sources*

Description

Data sources providing oceanographic data.

Usage

```
sources_oceanographic(name, formats, time_resolutions, ...)
```

Arguments

`name`	character vector: only return data sources with name or id matching these values
`formats`	character: for some sources, the format can be specified. See the list of sources above for details
`time_resolutions`	character: for some sources, the time resolution can be specified. See the list of sources above for details
`...`	: additional source-specific parameters. See the list of sources above for details

Details

- "CSIRO Atlas of Regional Seas 2009": CARS is a digital climatology, or atlas of seasonal ocean water properties
- "World Ocean Atlas 2009": World Ocean Atlas 2009 is included here for convenience but has been superseded by the World Ocean Atlas 2013 V2
- "World Ocean Atlas 2013 V2": World Ocean Atlas 2013 version 2 (WOA13 V2) is a set of objectively analyzed (1 degree grid) climatological fields of in situ temperature, salinity, dissolved oxygen, Apparent Oxygen Utilization (AOU), percent oxygen saturation, phosphate, silicate, and nitrate at standard depth levels for annual, seasonal, and monthly compositing periods for the World Ocean. It also includes associated statistical fields of observed oceanographic profile data interpolated to standard depth levels on 5 degree, 1 degree, and 0.25 degree grids
- "World Ocean Atlas 2018": The World Ocean Atlas (WOA) is a collection of objectively analyzed, quality controlled temperature, salinity, oxygen, phosphate, silicate, and nitrate means based on profile data from the World Ocean Database (WOD). It can be used to create boundary and/or initial conditions for a variety of ocean models, verify numerical simulations of the ocean, and corroborate satellite data
- "Argo ocean basin data (USGODAE)": Argo float data from the Global Data Access Centre in Monterey, USA (US Global Ocean Data Assimilation Experiment). These are multi-profile netcdf files divided by ocean basin. Accepts `region` parameter values of "pacific" (default), "atlantic", and/or "indian". Also accepts `years` parameter: an optional vector of years to download data for

- "Argo profile data": Argo profile data, by default from the Global Data Access Centre in Monterey, USA (US Global Ocean Data Assimilation Experiment). The DAC can be changed by specifying a `dac_url` parameter (see example below). Also see `bb_handler_argo` for a description of the other parameters that this source accepts.
- "Roemmich-Gilson Argo Climatology": A basic description of the modern upper ocean based entirely on Argo data is available here, to provide a baseline for comparison with past datasets and with ongoing Argo data, to test the adequacy of Argo sampling of large-scale variability, and to examine the consistency of the Argo dataset with related ocean observations from other programs
- "Effects of Sound on the Marine Environment": ESME uses publically available environmental data sources that provide detailed information about the ocean: (1) Bottom Sediment Type (BST) v 2.0, (2) Digital Bathymetry Database (DBDB) v 5.4, (3) Generalized Digital Environment Model (GDEM) v 3.0, (4) Surface Marine Gridded Climatology (SMGC) v 2.0"

The returned tibble contains more information about each source.

Value

a tibble with columns as specified by `bowerbird::bb_source()`

References

See the `doc_url` and `citation` field in each row of the returned tibble for references associated with these particular data sources

Examples

```
## Not run:
## define a configuration and add the Atlas of Regional Seas data to it
cf <- bb_config("/my/file/root")
src <- sources_oceanographic("CSIRO Atlas of Regional Seas 2009")
cf <- bb_add(cf,src)

## Argo data, Pacific ocean basin only, all years
src <- sources_oceanographic("Argo ocean basin data (USGODAE)", region="pacific")

## Argo data, Pacific ocean basin for 2018 only
src <- sources_oceanographic("Argo ocean basin data (USGODAE)",
  region="pacific", years=2018)

## Argo data, all ocean basins and for 2017 and 2018 only
src <- sources_oceanographic("Argo ocean basin data (USGODAE)",
  region=c("pacific", "indian", "atlantic"), years=c(2017, 2018))

## Argo merge profile data, from the French GDAC (ftp://ftp.ifremer.fr/ifremer/argo/)
## Only download profiles from institutions "CS" or "IN", south of 30S,
##  with parameter "NITRATE" or "CHLA"
src <- sources_oceanographic("Argo profile data", profile_type = "merge",
                             dac_url = "ftp://ftp.ifremer.fr/ifremer/argo/",
                             institutions = c("CS", "IN"),
                             latitude_filter = function(z) z < -30,
```

```
                                parameters = c("CHLA", "NITRATE"))

## End(Not run)
```

`sources_reanalysis` *Reanalysis data sources*

Description

Data sources providing data from global reanalysis models.

Usage

```
sources_reanalysis(name, formats, time_resolutions, ...)
```

Arguments

`name`	character vector: only return data sources with name or id matching these values
`formats`	character: for some sources, the format can be specified. See the list of sources above for details
`time_resolutions`	character: for some sources, the time resolution can be specified. See the list of sources above for details
`...`	: additional source-specific parameters. See the list of sources above for details

Details

- "NCEP-DOE Reanalysis 2": NCEP-DOE Reanalysis 2 is an improved version of the NCEP Reanalysis I model that fixed errors and updated paramterizations of of physical processes. Accepts `time_resolution` values of "6 hour", "day", and/or "month" (default). The 6-hourly data is the original output time resolution. Daily and monthly averages are calculated from the 6-hourly model output
- "NCEP/NCAR Reanalysis 1": The NCEP/NCAR Reanalysis 1 project is using a state-of-the-art analysis/forecast system to perform data assimilation using past data from 1948 to the present. Only the monthly data are so far included here
- "CCMP Wind Product V2": The Cross-Calibrated Multi-Platform (CCMP) gridded surface vector winds are produced using satellite, moored buoy, and model wind data, and are a Level-3 ocean vector wind analysis product. The V2 CCMP processing combines Version-7 RSS radiometer wind speeds, QuikSCAT and ASCAT scatterometer wind vectors, moored buoy wind data, and ERA-Interim model wind fields using a Variational Analysis Method (VAM) to produce four maps daily of 0.25 degree gridded vector winds

The returned tibble contains more information about each source.

Value

a tibble with columns as specified by `bowerbird::bb_source()`

References

See the doc_url and citation field in each row of the returned tibble for references associated with these particular data sources

Examples

```
## Not run:
## define a configuration and add the monthly NCEP2 data to it
cf <- bb_config("/my/file/root") %>%
  bb_add(sources_reanalysis("NCEP-DOE Reanalysis 2",time_resolution="month"))

## End(Not run)
```

---

sources_sdm *Data sources intended for species distribution modelling and similar tasks*

Description

Data sources providing environmental and similar gridded data, suitable for species distribution modelling, regionalisation analyses, and similar tasks.

Usage

```
sources_sdm(name, formats, time_resolutions, ...)
```

Arguments

name	character vector: only return data sources with name or id matching these values
formats	character: for some sources, the format can be specified. See the list of sources above for details
time_resolutions	character: for some sources, the time resolution can be specified. See the list of sources above for details
...	: additional source-specific parameters. See the list of sources above for details

Details

- "Southern Ocean marine environmental data": a collection of gridded marine environmental data layers suitable for use in Southern Ocean species distribution modelling. All environmental layers have been generated at a spatial resolution of 0.1 degrees, covering the Southern Ocean extent (80 degrees S - 45 degrees S, -180 - 180 degrees). The layers include information relating to bathymetry, sea ice, ocean currents, primary production, particulate organic carbon, and other oceanographic data. See the vignette for more information: `vignette("SO_SDM_data", package = "blueant")`

The returned tibble contains more information about each source.

Value

a tibble with columns as specified by bowerbird::bb_source()

References

See the doc_url and citation field in each row of the returned tibble for references associated with these particular data sources

Examples

```
## Not run:
## define a configuration, storing data in a temporary directory
cf <- bb_config(local_file_root = tempdir())

## add the marine environmental data layers
cf <- cf %>% bb_add(sources_sdm("Southern Ocean marine environmental data"))

## sync it (get the data)
res <- bb_sync(cf, verbose = TRUE)

## see the vignette for more information on this data source:
vignette("SO_SDM_data", package = "blueant")

## End(Not run)
```

---

sources_seaice *Sea ice data sources*

Description

Data sources providing (primarily satellite-derived) sea ice data:

- "Sea Ice Concentrations from Nimbus-7 SMMR and DMSP SSM/I-SSMIS Passive Microwave Data, Version 2". Passive microwave estimates of sea ice concentration at 25km spatial resolution. Daily and monthly resolution, available from 1-Oct-1978 to near-present. Data undergo a quality checking process and are updated annually. Available only in netcdf format. Accepts hemisphere values of "south", "north", "both". More recent data are available via the 'Near-Real-Time DMSP SSMIS Daily Polar Gridded Sea Ice Concentrations, Version 2' source
- "Near-Real-Time DMSP SSMIS Daily Polar Gridded Sea Ice Concentrations, Version 2". Near-real-time passive microwave estimates of sea ice concentration at 25km, daily resolution. Available only in netcdf format. Accepts hemisphere values of "south", "north", "both". Accepts time_resolution values of "day" or "month". Accepts years parameter as a vector of years.
- "NSIDC passive microwave supporting files": Grids and other support files for NSIDC passive microwave sea ice data

- "Nimbus Ice Edge Points from Nimbus Visible Imagery": This data set (NmIcEdg2) estimates the location of the North and South Pole sea ice edges at various times during the mid to late 1960s, based on recovered Nimbus 1 (1964), Nimbus 2 (1966), and Nimbus 3 (1969) visible imagery
- "Artist AMSR-E sea ice concentration": Passive microwave estimates of daily sea ice concentration at 6.25km spatial resolution, from 19-Jun-2002 to 2-Oct-2011. Previously accepted formats "geotiff" and/or "hdf", but these are now ignored (the only file format available now is netcdf)
- "Artist AMSR2 near-real-time sea ice concentration": Near-real-time passive microwave estimates of daily sea ice concentration at 6.25km spatial resolution, from 24-July-2012 to present. Accepts a `formats` parameter containing one or more of "netcdf", "hdf", "png", "tif"
- "Artist AMSR2 near-real-time 3.125km sea ice concentration": Near-real-time passive microwave estimates of daily sea ice concentration at 3.125km spatial resolution, from 24-July-2012 to present. Accepts a `formats` parameter containing one or more of "netcdf", "hdf", "png", "tif"
- "Artist AMSR2 supporting files": Grids and landmasks for Artist AMSR2 passive microwave sea ice data
- "CERSAT SSM/I sea ice concentration": Passive microwave sea ice concentration data at 12.5km resolution, 3-Dec-1991 to present
- "CERSAT SSM/I sea ice concentration supporting files": Grids for the CERSAT SSM/I sea ice concentration data
- "Sea ice lead climatologies": Long-term relative sea ice lead frequencies for the Arctic (November - April 2002/03 - 2018/19) and Antarctic (April - September 2003 - 2019) derived from Moderate-Resolution Imaging Spectroradiometer (MODIS) imagery
- "MODIS Composite Based Maps of East Antarctic Fast Ice Coverage": Maps of East Antarctic landfast sea-ice extent, generated from approx. 250,000 1 km visible/thermal infrared cloud-free MODIS composite imagery (augmented with AMSR-E 6.25-km sea-ice concentration composite imagery when required). Coverage from 2000-03-01 to 2008-12-31
- "Circum-Antarctic landfast sea ice extent": maps of Antarctic landfast sea ice, derived from NASA MODIS imagery. There are 24 maps per year, spanning the 18 year period from March 2000 to Feb 2018
- "National Ice Center Antarctic daily sea ice charts": The USNIC Daily Ice Edge product depicts the daily sea ice pack in red (8-10/10ths or greater of sea ice), and the Marginal Ice Zone (MIZ) in yellow. The marginal ice zone is the transition between the open ocean (ice free) and pack ice. The MIZ is very dynamic and affects the air-ocean heat transport, as well as being a significant factor in navigational safety. The daily ice edge is analyzed by sea ice experts using multiple sources of near real time satellite data, derived satellite products, buoy data, weather, and analyst interpretation of current sea ice conditions. The product is a current depiction of the location of the ice edge vice a satellite derived ice edge product. Accepts a `formats` parameter which can be one of "filled" or "vector". Accepts a `years` parameter to restrict the data to certain years
- "Polarview Sentinel-1 imagery": Sentinel-1 imagery from polarview.aq. Accepts an `acquisition_date` parameter (default is the last four days including today), a `formats` parameter (one or both of "jpg", "geotiff", default is both), and a `polygon` parameter, which is a polygon within

which to search - either a WKT polygon string in EPSG:3031 projection, or an object of class `sfc_POLYGON`, which will be converted to a WKT string internally

- "ATLAS/ICESat-2 L3B Daily and Monthly Gridded Sea Ice Freeboard, Version 5": daily and monthly gridded estimates of sea ice freeboard, derived from ATLAS/ICESat-2 L3A Sea Ice Freeboard (ATL10) along-track freeboard estimates
- "NOAA/NSIDC Climate Data Record of Passive Microwave Sea Ice Concentration, Version 4": superseded by Version 6
- "NOAA-NSIDC Climate Data Record of Passive Microwave Sea Ice Concentration Version 6": a Climate Data Record of sea ice concentration from passive microwave data. The CDR algorithm output is a rule-based combination of ice concentration estimates from two well-established algorithms: the NASA Team (NT) algorithm (Cavalieri et al. 1984) and NASA Bootstrap (BT) algorithm (Comiso 1986). The CDR is a consistent, daily and monthly time series of sea ice concentrations from 25 October 1978 through the most recent processing. Accepts `hemisphere` values of "south", "north", "both" and `time_resolution` values of "day" or "month"
- "Near-Real-Time NOAA/NSIDC Climate Data Record of Passive Microwave Sea Ice Concentration, Version 2": superseded by Version 4
- "Near-Real-Time NOAA/NSIDC Climate Data Record of Passive Microwave Sea Ice Concentration, Version 4": a near-real-time Climate Data Record (CDR) of sea ice concentration from passive microwave data. The Near-real-time NOAA/NSIDC Climate Data Record of Passive Microwave Sea Ice Concentration (NRT CDR) data set is the near-real-time version of the final NOAA/NSIDC Climate Data Record of Passive Microwave Sea Ice Concentration. The NRT CDR is designed to fill the temporal gap between updates of the final CDR, occurring every three to six months, and to provide the most recent data. Accepts `hemisphere` values of "south", "north", "both" and `time_resolution` values of "day" or "month"
- "OSI SAF Global Low Resolution Sea Ice Drift": ice motion vectors with a time span of 48 hours are estimated by an advanced cross-correlation method (the Continuous MCC, CMCC) on pairs of satellite images. The merged (multi-sensor) dataset is provided here

Usage

```
sources_seaice(name, formats, time_resolutions, ...)
```

Arguments

`name`	character vector: only return data sources with name or id matching these values
`formats`	character: for some sources, the format can be specified. See the list of sources above for details
`time_resolutions`	character: for some sources, the time resolution can be specified. See the list of sources above for details
`...`	: additional source-specific parameters. See the list of sources above for details

Details

The returned tibble contains more information about each source.

Value

a tibble with columns as specified by bowerbird::bb_source()

References

See the doc_url and citation field in each row of the returned tibble for references associated with these particular data sources

Examples

```
## Not run:
## define a configuration and add the AMSR-E data to it (geotiff format)
cf <- bb_config("/my/file/root") %>%
  bb_add(sources_seaice("Artist AMSR-E sea ice concentration",formats="geotiff"))

## the NSIDC SMMR-SSM/I Nasateam sea ice concentration, but only
##    southern hemisphere, monthly data from 2013
cf <- bb_config("/my/file/root") %>%
  bb_add(sources_seaice("NSIDC SMMR-SSM/I Nasateam sea ice concentration",
                        time_resolutions = "month", hemisphere = "south", years = 2013))

## End(Not run)
```

---

sources_sst *Sea surface temperature data sources*

Description

Data sources providing SST data.

Usage

```
sources_sst(name, formats, time_resolutions, ...)
```

Arguments

name	character vector: only return data sources with name or id matching these values
formats	character: for some sources, the format can be specified. See the list of sources above for details
time_resolutions	character: for some sources, the time resolution can be specified. See the list of sources above for details
...	: additional source-specific parameters. See the list of sources above for details

Details

- "NOAA OI 1/4 Degree Daily SST AVHRR": Sea surface temperature at 0.25 degree daily resolution, from 1-Sep-1981 to present (this is v2.1 of the daily OI SST product)
- "NOAA OI 1/4 Degree Daily SST AVHRR v2": Superseded by v2.1, above. Sea surface temperature at 0.25 degree daily resolution, from 1-Sep-1981 to Apr-2020
- "NOAA OI SST V2 High Resolution": Monthly mean and long-term monthly mean SST data from Optimum Interpolation Sea Surface Temperature (OISST), 0.25-degree resolution, 1981 to present. Ice concentration data are also included, which are the ice concentration values input to the SST analysis
- "NOAA OI SST V2": Superseded by NOAA OI SST V2 High Resolution, above. Weekly and monthly mean and long-term monthly mean SST data, 1-degree resolution, 1981 to present. Ice concentration data are also included, which are the ice concentration values input to the SST analysis
- "NOAA Extended Reconstructed SST V3b": A global monthly SST analysis from 1854 to the present derived from ICOADS data with missing data filled in by statistical methods
- "NOAA Extended Reconstructed SST V5": A global monthly sea surface temperature dataset derived from the International Comprehensive Ocean-Atmosphere Dataset
- "Oceandata MODIS Terra Level-3 mapped monthly 9km SST": Monthly remote-sensing sea surface temperature from the MODIS Terra satellite at 9km spatial resolution
- "Oceandata MODIS Aqua Level-3 mapped monthly 9km SST": Monthly remote-sensing SST from the MODIS Aqua satellite at 9km spatial resolution
- "GHRSST Level 4 MUR Global Foundation SST v4.1": A Group for High Resolution Sea Surface Temperature (GHRSST) Level 4 sea surface temperature analysis produced as a retrospective dataset (four day latency) on a global 0.011 degree grid
- "CMEMS Global Ocean OSTIA Sea Surface Temperature and Sea Ice Analysis": for the global ocean, the OSTIA global foundation Sea Surface Temperature product provides daily gap-free maps of: Foundation Sea Surface Temperature at 0.05 degree horizontal grid resolution, using in-situ and satellite data from both infrared and microwave radiometers

The returned tibble contains more information about each source.

Value

a tibble with columns as specified by `bowerbird::bb_source()`

References

See the `doc_url` and `citation` field in each row of the returned tibble for references associated with these particular data sources

Examples

```
## Not run:
## define a configuration and add the OIv2 SST data to it
cf <- bb_config("/my/file/root")
src <- sources_sst("NOAA OI SST V2")
cf <- bb_add(cf,src)
```

```
## End(Not run)
```

`sources_topography` *Topographical data sources*

Description

Data sources providing topographical data.

Usage

```
sources_topography(name, formats, time_resolutions, ...)
```

Arguments

`name`	character vector: only return data sources with name or id matching these values
`formats`	character: for some sources, the format can be specified. See the list of sources above for details
`time_resolutions`	character: for some sources, the time resolution can be specified. See the list of sources above for details
`...`	: additional source-specific parameters. See the list of sources above for details

Details

- "Smith and Sandwell bathymetry": Global seafloor topography from satellite altimetry and ship depth soundings
- "GEBCO 2014 bathymetry": Global bathymetric grid at 30 arc-second intervals
- "GEBCO 2019 bathymetry": Global bathymetric grid at 15 arc-second intervals
- "GEBCO 2021 bathymetry": The GEBCO_2021 Grid is a global terrain model for ocean and land, providing elevation data, in meters, on a 15 arc-second interval grid. It includes a number of additonal data sets compared to the GEBCO_2020 Grid. The grid is accompanied by a Type Identifier (TID) Grid, giving information on the types of source data that the GEBCO_2021 Grid is based on. The primary GEBCO_2021 grid contains land and ice surface elevation information - as provided for previous GEBCO grid releases. In addition, for the 2021 release, we have made available a version with under-ice topography/bathymetry information for Greenland and Antarctica
- "GEBCO 2024 bathymetry": The GEBCO_2024 Grid is a global terrain model for ocean and land, providing elevation data, in meters, on a 15 arc-second interval grid of 43200 rows x 86400 columns, giving 3,732,480,000 data points. The data values are pixel-centre registered i.e. they refer to elevations, in meters, at the centre of grid cells.
- "ETOPO1 bathymetry": ETOPO1 is a 1 arc-minute global relief model of Earth's surface that integrates land topography and ocean bathymetry

- "ETOPO2 bathymetry": 2-Minute Gridded Global Relief Data (ETOPO2v2c)
- "Bedmap2": Bedmap2 is a suite of gridded products describing surface elevation, ice-thickness and the sea floor and subglacial bed elevation of the Antarctic south of 60S
- "Revision of the Kerguelen Plateau bathymetric grid": digital elevation model (DEM) for the Kerguelen Plateau region. Superseded by "AusBathyTopo (Kerguelen Plateau) 100m 2022"
- "AusBathyTopo (Kerguelen Plateau) 100m 2022": bathymetry (depth) products from the compilation of all available source bathymetry data within the Kerguelen Plateau into a 100 m-resolution Digital Elevation Mode. Supersedes "Revision of the Kerguelen Plateau bathymetric grid"
- "George V bathymetry": Digital Elevation Models (DEMs) of varying resolutions for the George V and Terre Adelie continental margin, derived by incorporating all available single-beam and multibeam point depth data
- "Geoscience Australia multibeam bathymetric grids of the Macquarie Ridge": This is a compilation of all the processed multibeam bathymetry data that are publicly available in Geoscience Australia's data holding for the Macquarie Ridge
- "IBCSO bathymetry": The International Bathymetric Chart of the Southern Ocean (IBCSO) Version 1.0 is a digital bathymetric model portraying the seafloor of the circum-Antarctic waters south of 60S. IBCSO Version 1.0 has been compiled from all available bathymetric data collectively gathered by more than 30 institutions from 15 countries, including multibeam and single-beam echo soundings, digitized depths from nautical charts, regional bathymetric gridded compilations, and predicted bathymetry
- "IBCSO chart for printing": The IBCSO Poster, 2013, is a polar stereographic view of the Southern Ocean displaying bathymetric contours south of 60S at a scale of 1:7,000,000
- "IBCSOv2 bathymetry": The International Bathymetric Chart of the Southern Ocean Version 2 (IBCSO v2) is a digital bathymetric model for the area south of 50S with special emphasis on the bathymetry of the Southern Ocean. IBCSO v2 has a resolution of 500 m x 500 m in a Polar Stereographic projection. The total data coverage of the seafloor is 23.79% with a multibeam-only data coverage of 22.32%. The remaining 1.47% include singlebeam and other data. IBCSO v2 is the most authoritative seafloor map of the area south of 50S.
- "IBCSO 2024 Annual Release": NO LONGER AVAILABLE - 2024 update to IBCSOv2
- "IBCSO Annual Release": the rolling annual update to IBCSOv2. Note that the annual release is a rolling product, which means that a new version replaces the existing one and that old one becomes unavailable.
- "RTOPO-1 Antarctic ice shelf topography": a consistent dataset of Antarctic ice sheet topography, cavity geometry, and global bathymetry
- "Radarsat Antarctic digital elevation model V2": The high-resolution Radarsat Antarctic Mapping Project (RAMP) digital elevation model (DEM) combines topographic data from a variety of sources to provide consistent coverage of all of Antarctica. Version 2 improves upon the original version by incorporating new topographic data, error corrections, extended coverage, and other modifications
- "New Zealand Regional Bathymetry 2016": NO LONGER AVAILABLE - The NZ 250m gridded bathymetric data set and imagery, Mitchell et al. 2012, released 2016
- "Cryosat-2 digital elevation model": a digital elevation model of Antarctica derived from 6 years of continuous CryoSat-2 measurements

- "Natural Earth 10m physical vector data": Natural Earth is a public domain map dataset available at 1:10m, 1:50m, and 1:110 million scales
- "GSHHG coastline data": a Global Self-consistent, Hierarchical, High-resolution Geography Database
- "Shuttle Radar Topography Mission elevation data SRTMGL1 V3": Global 1-arc-second topographic data generated from NASA's Shuttle Radar Topography Mission. Version 3.0 (aka SRTM Plus or Void Filled) removes all of the void areas by incorporating data from other sources such as the ASTER GDEM
- "Reference Elevation Model of Antarctica mosaic tiles": The Reference Elevation Model of Antarctica (REMA) is a high resolution, time-stamped digital surface model of Antarctica at 8-meter spatial resolution (and reduced-resolution, resampled versions). Accepts a single `spatial_resolution` value of "1km", "200m" (default), "100m", "8m"
- "EGM2008 GIS Data": Global 2.5 Minute Geoid Undulations.
- "AAS_4116_Coastal_Complexity": This dataset provides a characterisation of Antarctic coastal complexity. At each point, a complexity metric is calculated at length scales from 1 to 256 km, giving a multiscale estimate of the magnitude and direction of undulation or complexity at each point location along the entire coastline.

The returned tibble contains more information about each source.

Value

a tibble with columns as specified by `bowerbird::bb_source()`

References

See the `doc_url` and `citation` field in each row of the returned tibble for references associated with these particular data sources

Examples

```
## Not run:
## define a configuration and add the Smith and Sandwell bathymetry
cf <- bb_config("/my/file/root") %>%
  bb_add(sources_topography("Smith and Sandwell bathymetry"))

## End(Not run)
```

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